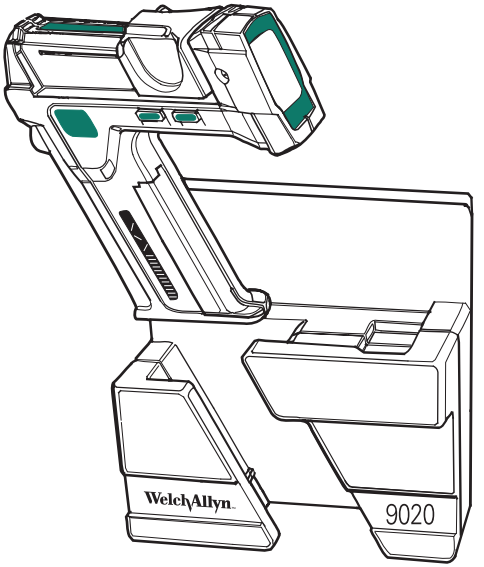


Welch Allyn
9020 Infrared Tympanic Thermometer

Directions For Use

CE 0050

Welch Allyn™

The CE mark on this product indicates it has been tested to and conforms with the provisions noted within the 93/42/EEC Medical Device Directive.

European Regulatory Manager, Medical Division
Welch Allyn Ltd., Navan, Co. Meath
Republic of Ireland

©1996 by Welch Allyn, Inc. All rights reserved.

Printed in the U.S.A.

WELCH ALLYN is a registered trademark of Welch Allyn, Inc.

FOR TECHNICAL SUPPORT AND CUSTOMER SERVICE

Welch Allyn, Inc.
7420 Carroll Road
San Diego, CA 92121-2334
(619) 621-6600
(800) 854-2904

U.S. Patents 265,525; 4,863,211; 4,911,559; 4,993,424, 4,993,438; and 5,018,872; Australia 108527 and 108528; Belgium 19809 and 19694; Canada 2,001,196-3; 66391 and 66392; Denmark MR 0272 1991 and MR 0273 1991; Norwegian 68692 and 68.370; Sweden 48,348; 48, 347; Switzerland 117,864 and 117,865; Taiwan R.O.C. New Invention Pat. No. ND-25315; ND 25316; and 42337; United Kingdom 2001897 and 2001898; West Germany M 89 07 483.1 and M 89 07 556.0; Additional U.S. and Foreign Patents Issued and Pending.

CONTENTS

INTRODUCTION 1
- Infrared Thermometry 1
- Key Benefits 1

FEATURES 2

WALL MOUNT (OPTION) 3
- Removing the 9020 from the Wall Mount 3

CONTROLS 4

DISPLAY INDICATORS 6

OPERATION MODES 8

PROBE COVERS 10

OPERATING PROCEDURES 11
- Taking Temperatures in Oral, Core, Rectal Modes 11
- Proper Technique 14
- Taking Temperatures in Surface Mode 14
- Changing Operation Modes 15
- Self Test 15

MAINTENANCE 16
- Changing the Probe Cover Dispenser 16
- Cleaning the Probe Sensor Lens 17
  - Method 1: Removing Light Dust 17
  - Method 2: Removing Smudges or Excessive Debris 18
- Cleaning the Thermometer 19
- Changing the Probe Tip 20
- Replacing the Batteries 21

THEFT PROTECTION 22

OPTIONS & ACCESSORIES 22

TROUBLESHOOTING 23

ERROR CODES 27

SECURITY CABLE INSTALLATION (OPTION) 28

WALL MOUNT INSTALLATION (OPTION) 29

SPECIFICATIONS 30

LIMITED WARRANTY 31

INTRODUCTION

The Welch Allyn™ Model 9020 tympanic thermometer incorporates infrared optics with advanced microelectronics to quickly and efficiently register tympanic membrane-derived temperatures.

INFRARED THERMOMETRY

All matter emits thermally-generated electromagnetic waves. As the temperature of an object increases, it increased radiates infrared energy (heat rays) at amplitudes and wavelengths corresponding to its temperature.

The infrared sensing system of the 9020, co-developed with NASA's Jet Propulsion Laboratory, employs state-of-the art technology to measure infrared radiation within the ear canal. The thermometer calculates the patient's temperature from the highest level of infrared energy detected.

Clinical studies indicate that the temperature of the tympanic membrane correlates well with core body temperature.

KEY BENEFITS

The ergonomically-designed 9020 offers the most noninvasive approach to determine body temperature.

Tympanic site measurements enhance patient comfort and avoid contact with mucous membranes, substantially minimizing the risk of cross-contamination.

In addition, tympanic temperatures are not affected by patient-specific variables such as respiration, eating, drinking, and smoking.

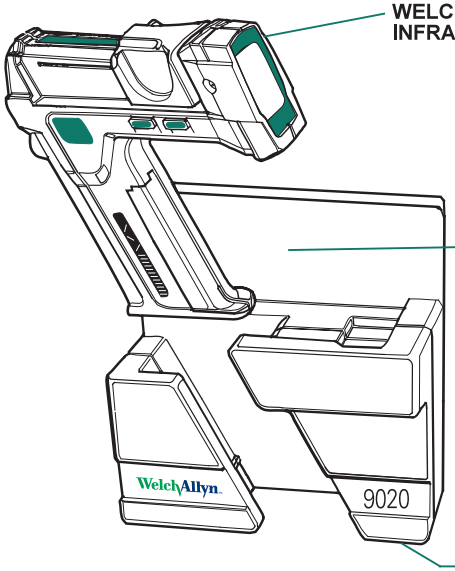
The 9020 is ideal for intubated patients and others who cannot have their temperatures taken orally.

NOTE: This manual provides important instructions. Be sure to read the "Operating Procedures" section carefully. We recommend that you practice taking a temperature to familiarize yourself with the 9020 and develop the proper technique to ensure safe, quick, and accurate temperatures.

FEATURES

- Approximately 1-second scan time to register body temperature
- Patented, fully-enclosed probe cover dispenser holds 100 disposable probe covers
- Automated placement of probe covers to maintain cleanliness
- Retractable probe tip protects sensor when thermometer not in use
- Probe cannot be extended when probe cover dispenser is empty or missing
- Choice of operating modes includes oral, core, and rectal equivalency
- Surface operating mode scans skin surface temperatures
- One-touch Fahrenheit – Celsius selector switch
- Simple, 1–2–3 step operation
- Convenient and lightweight one-piece design
- Large, LCD display shows temperature, mode, and other status indicators.
- Visual and audible pulse/ respiration timer
- Memory recall displays last temperature taken
- Thermometer continuously and automatically self-calibrates before every use
- Optional wall mount allows the thermometer to be locked into place.
- Field calibration can be performed in minutes with the Welch Allyn 9600 Calibration Tester

WALL MOUNT (OPTION)



WELCH ALLYN 9020
INFRARED AURAL THERMOMETER

WALL MOUNT (OPTIONAL)

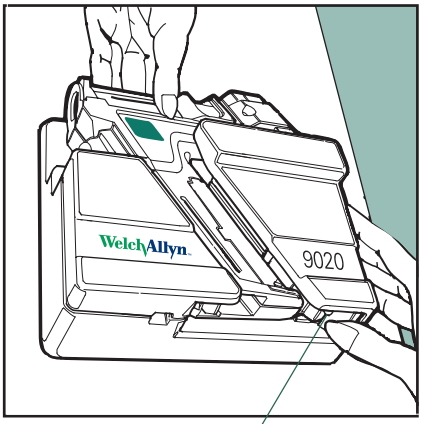
Holds the 9020 when not in use. Compact design installs vertically, allowing convenient access to the thermometer. A single 9020 can be used with additional wall mounts, installed in different locations.

RELEASE KEY
(UNDERSIDE OF WALL MOUNT)

Allows you to remove the 9020 from the wall mount, or lock it in place.

REMOVING THE 9020 FROM THE WALL MOUNT

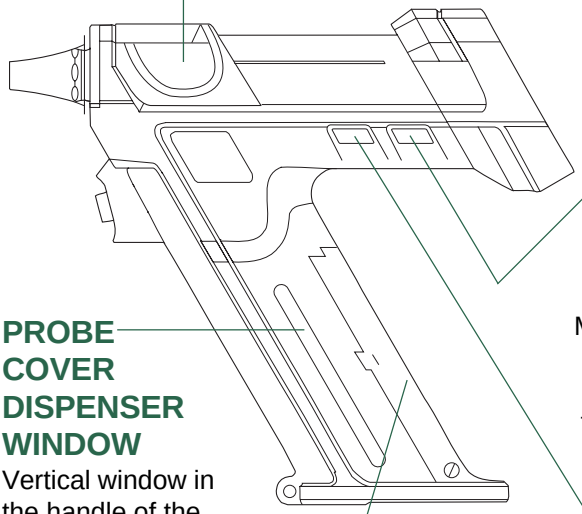
Lift the 9020 out of the wall mount while holding the release key to the right (as shown here). This release key temporarily disengages the wall mount's spring latch mechanism and allows the thermometer to be removed.



CONTROLS

SLIDE

Moves forward to extend the probe, automatically applying a probe cover. Moves backward to retract the probe, automatically removing the probe cover. Once the probe is partially advanced or partially retracted, you cannot reverse the direction of the slide. ***The slide will not move unless a probe cover dispenser containing probe covers is in place.***



RECALL BUTTON

When pressed, the last temperature taken will appear on the display for 5 seconds. Moving the slide forward erases the previous temperature from the thermometer's memory.

PROBE COVER DISPENSER WINDOW

Vertical window in the handle of the 9020 allows you to check the supply of probe covers remaining in the dispenser.

BATTERY COMPARTMENT

Approximately 1 year of operation (depending on usage) from each set of 4 AAA batteries. Visual and audible signals indicate when batteries are low.

MODE SWITCH

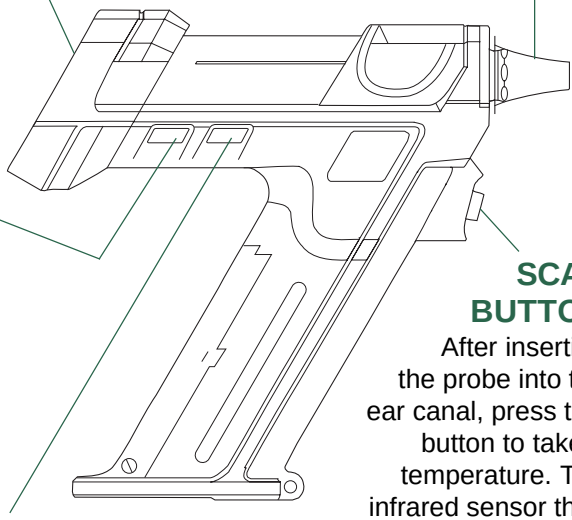
Cycles through Oral, Rectal, Core, and Surface to select the operation mode. Temperatures must be taken in the mode desired; they will not be converted between modes.

LCD DISPLAY

Display provides readout of temperature, status, operation mode, and error conditions. Ergonomically designed for visual access as you hold the thermometer.

PROBE

When inserted into the ear, the infrared sensor in the probe scans thermal energy radiated within the ear canal.



PULSE TIMER BUTTON

Pressing this button activates a 30-second visual and audible timer to measure respiration and/or pulse.

SCAN BUTTON

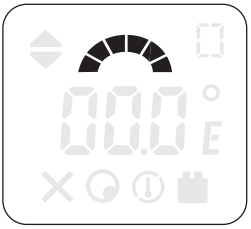
After inserting the probe into the ear canal, press this button to take a temperature. The infrared sensor then measures tympanic temperatures, and after 1 second with no increase in temperature, the highest of these temperatures is displayed.

°F/°C SWITCH

Toggles the thermometric scale between Fahrenheit and Celsius, at any time. When this button is pressed, the currently displayed temperature will be converted, and redisplayed.

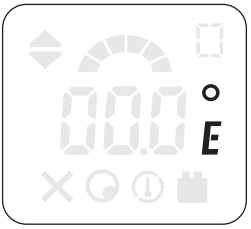
DISPLAY INDICATORS

30-SECOND PULSE TIMER



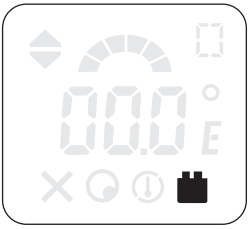
Press the PULSE TIMER button to check pulse or respiration. The first of six 5-second segments blinks once per second for five seconds, and then remains steady. The other segments continue the countdown pattern until 30 seconds has elapsed. The 9020 beeps when the timer is first activated, after 15 seconds, and again after 30 seconds.

FAHRENHEIT/CELSIUS



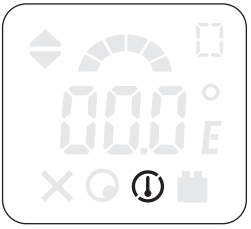
This indicator shows the current thermometric scale, Fahrenheit (F) or Celsius (C). Press the °F/°C switch to toggle between these scales, and the currently displayed temperature is automatically converted.

LOW BATTERY



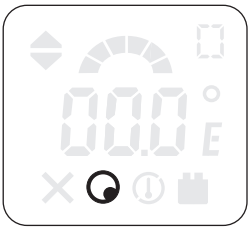
This symbol appears when the thermometer's microprocessor detects a low battery condition. Once the Battery symbol is displayed, the 9020 will not function until the batteries have been replaced.

THERMOMETER READY



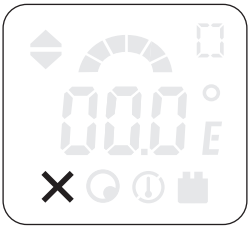
The Ready symbol (a thermometer in a circle) indicates that the 9020 has completed self-calibration procedures. The thermometer is ready for use in 2 – 15 seconds between temperature measurements.

RETRACT SLIDE



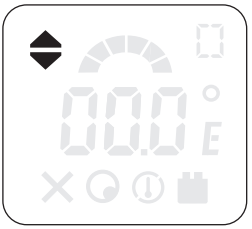
This symbol appears, along with an audible double-beep, as a reminder when the probe has not been fully retracted. After taking a temperature, always move the slide back to its original position to protect the probe from damage and debris.

MALFUNCTION



If the 9020 requires service due to an internal malfunction, this symbol appears, along with a numeric error code indicating the nature of the problem. When this indicator is displayed, no temperatures can be taken.

UNDER/OVER TEMPERATURE RANGE INDICATORS



This Up Arrow/Down Arrow symbol blinks for five seconds, then remains steady if the 9020 detects a temperature that is beyond the normal operating range (75.0°F – 108.0°F). The Down Arrow indicates a temperature below 75°F. The Up Arrow indicates a temperature above 108°F.

OPERATION MODES

The 9020 measures, converts, and displays temperatures in the following modes:

- Oral
- Core
- Rectal
- Surface

The oral, core, and rectal modes display tympanic temperatures that have been converted to reflect the corresponding temperature of the traditional oral, core, or rectal sites.

Conversion factors used by the 9020 are derived from statistical mean values obtained through comparisons of tympanic membrane-derived temperatures with corresponding oral, core, and rectal temperatures.

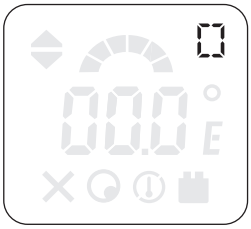
The surface mode shows the actual, unadjusted radiated temperatures measured during a scan (up to 30 seconds of continuous scan time).

To change operation modes, see the “Operating Procedures” section of this manual.

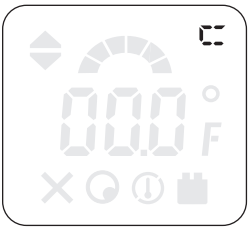
The current operation mode of the 9020 appears in the top, right corner of the thermometer’s display:

ORAL MODE

This mode converts the tympanic temperature to display its “oral equivalent.” Use this mode where glass or electronic oral thermometers are now used. The normal range of oral temperature is 97.6°F to 99.6°F (36.5°C to 37.5°C).

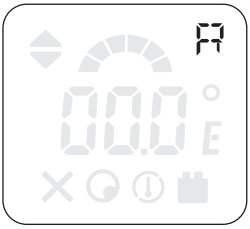


CORE MODE



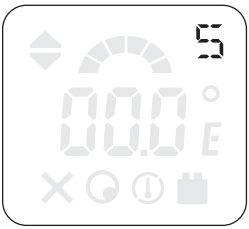
This mode converts the tympanic temperature to display its "core equivalent." Use this mode in areas where esophageal or pulmonary artery temperatures are now used. The normal range of core temperature is 98.2°F to 100.2°F (36.8°C to 37.9°C).

RECTAL MODE



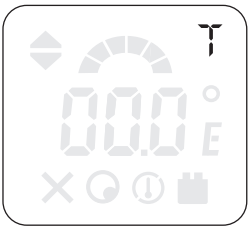
This mode converts the tympanic temperature to display its "rectal equivalent." Use this mode where glass or electronic rectal thermometers are now used. The normal range of rectal temperature is 98.6°F to 100.6°F (37.0°C to 38.1°C).

SURFACE MODE



This mode measures the temperatures of different surface areas. Pressing the SCAN button activates the infrared sensor and displays the continuous radiated temperatures. The thermometer shows the last temperature read when the SCAN button is released, or when 30 seconds has elapsed (a double beep sounds).

TEST MODE (NOT AN OPERATION MODE)



This mode displays an unadjusted temperature. The test mode is used exclusively to test or calibrate the 9020 thermometer using the WELCH ALLYN, 9600 Calibration Tester. Please note that this function is accessed by a special procedure described in the 9600 Operation Manual.

PROBE COVERS

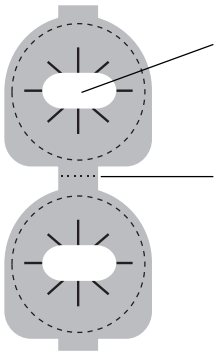
A dispenser of 100 disposable probe covers fits conveniently into the thermometer's handle. This one-piece design minimizes handling to protect both the patient and the probe covers from environmental contaminants. The 9020 will not operate unless a probe cover is in place.

NOTE: Use *only* WELCH ALLYN Model 050 probe covers with the 9020. The design and thermal properties of these probe covers ensure the most efficient measurement of tympanic temperature.

As you advance the slide to extend the probe, a cover is automatically positioned over the tip of the probe. The slide ***will not move*** unless a probe cover dispenser containing probe covers is in place.

When you retract the probe, the probe cover is ejected automatically. To avoid cross-contamination, probe covers cannot be reused.

Note that once the probe is partially advanced or partially retracted, you cannot reverse the direction of the slide.



Ultra-thin, heat-energy transparent film stretches evenly over the entire probe tip.

Probe covers are attached to one another within the probe cover dispenser; as one cover is used, the next one advances into place, ready for the next temperature.

WARNING: A damaged probe cover could affect the accuracy of a temperature reading. If a probe cover is torn, retract the probe, wait for the Ready symbol, then advance the slide again to apply a new probe cover.

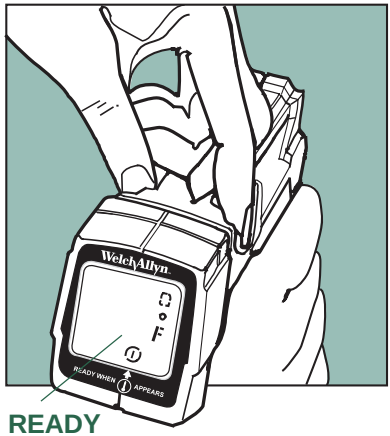
OPERATING PROCEDURES

TAKING TEMPERATURES IN ORAL, CORE, RECTAL MODES

1 Slowly move slide forward to extend probe, automatically applying probe cover.

Look for the Ready symbol on the display before you advance the slide. This can take from 2–15 seconds, depending on when the last temperature was taken.

Make sure that the temperature scale (°F, °C) and the operation mode (Oral, Core, Rectal) are those that you want to use to take the temperature.



READY SYMBOL

Check the condition of the patient's ear. The 9020 should not be used if any discharge is present in or around the ear.

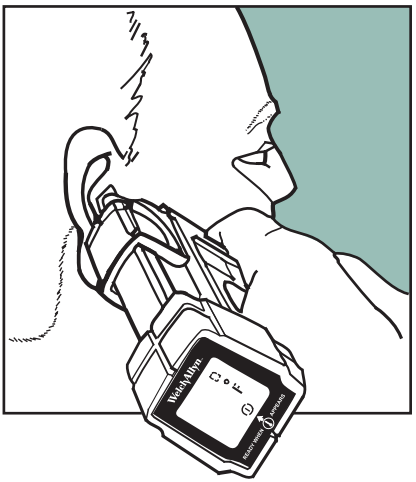
After extending the probe, inspect the probe cover. If it is damaged or misaligned, return the slide to its original position to discard the probe cover. Wait for the Ready symbol, then extend the probe again.

Take the temperature within 30 seconds after extending the probe. If the probe remains extended for more than 30 seconds, you will hear a double-beep every 5 seconds for 5 minutes or until you retract the probe. The 9020 will then recalibrate automatically and be ready for use in a few seconds.

2 Insert probe snugly into ear, completely closing off ear canal. Position probe towards patient's opposite temple, press SCAN button, and wait for beep.

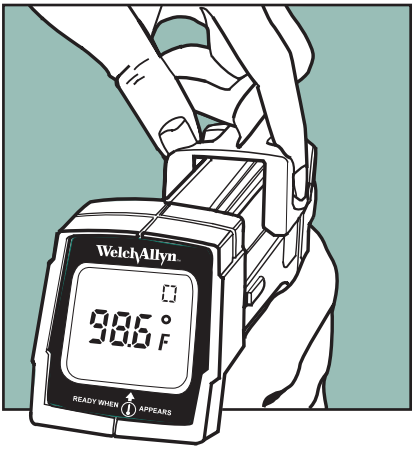
For optimum control, obtain a temperature in the patient's right ear if you are right-handed. Use the patient's left ear if you are left-handed.

After approximately 1 second, a single beep will sound to indicate that the temperature has been taken.



NOTE: Please be sure to read the next section, "Proper Technique," for important information about the technique required to obtain accurate temperatures.

3 Remove probe from ear. Retract slide, automatically removing probe cover. Read and record temperature.



After the beep, indicating that the temperature has been taken, withdraw the probe from the patient's ear.

Removing the probe prior to the beep may result in a temperature measurement that is lower than the actual temperature.

Hold the 9020 over a waste container, then return the slide back to its original position to retract the probe. As you do, the probe cover is automatically removed. Read and record the temperature.

The temperature will remain displayed for five minutes, unless you take another temperature.

Before repeating a temperature measurement using the same ear of the patient, wait 2 minutes to allow tympanic temperatures to stabilize, or use the opposite ear. Note that slight, but insignificant, differences in temperature often exist between the right ear and the left ear.

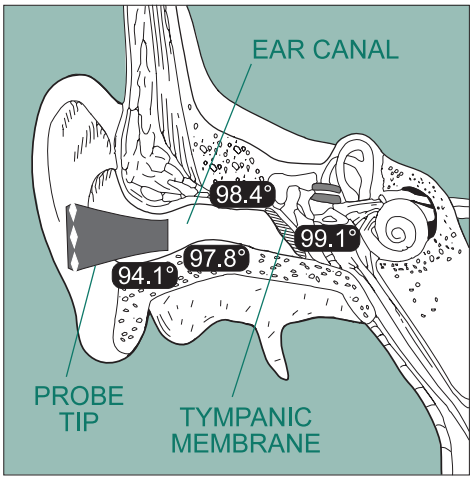
PROPER TECHNIQUE

Obtaining correct temperature measurements with the 9020, as with any thermometer, requires the proper technique.

There is a temperature gradient within the ear canal that causes variations in temperature of up to 5°F, as shown in this diagram.

Temperatures are lowest at the external opening of the ear canal due to ambient air temperature.

The highest temperatures occur at the deepest portion of the ear canal, at or around the tympanic membrane.



Measuring the tympanic membrane provides the most accurate temperature. However, the 9020's infrared sensor will register only the tympanic temperatures that it can "see" during a temperature measurement.

In some patients, anatomical characteristics of the ear canal may obstruct the sensor's view of the tympanic membrane.

You should optimize the sensor's field of view by consistently:

- Positioning the probe snugly to close off the ear canal
- Directing the probe toward the opposite temple.

TAKING TEMPERATURES IN SURFACE MODE

Follow these steps to measure skin surface temperatures with the 9020:

- Make sure that the Ready symbol is displayed, and that the thermometer is in the surface (S) operation mode. For information, see the "Operation Modes" and "Changing Operation Modes" sections of this manual.

- Advance the slide to extend the probe tip, automatically applying a probe cover.
- Hold the probe approximately 1/4" above the skin surface, and position the sensor lens to "see" the area to be scanned.
- Press and ***hold*** the SCAN button. Updated temperature readings appear on the display approximately four times a second for up to 30 seconds. After 30 seconds, a double beep sounds, and the *last* surface temperature read is displayed.
- Release the SCAN button. Slowly retract the slide to its original position, automatically removing the probe cover. Return the 9020 to the wall mount.

CHANGING OPERATION MODES

You can change the operating mode of the 9020 at any time to measure and display oral (O), core (C), rectal (R), or surface (S) temperatures. For more information, see the "Operation Modes" section of this manual.

- Insert a pointed object, such as a paper clip, through the small hole in the Mode button.
- Press in and hold the mode switch to cycle through the operation modes. When the desired mode appears in the upper, right corner of the display, release the Mode switch.

NOTE: Temperatures cannot be converted between modes. If you take a temperature, then change the operation mode, pressing the RECALL button will display that temperature in the previous mode.

SELF TEST

All segments of the display (LCD) are turned on for 1/2 second while the probe is being moved out of the thermometer case; this is to permit the verification of proper display operation.

The thermometer performs an internal self test continually while the unit is self calibrating. The results are displayed as a "Test Temperature" 98.6°F (37°C) nominal, for 1/2 second following the display test. The "Test Temperature" is also compared against internal limits, If the limit test fails, a malfunction is displayed.

MAINTENANCE

CHANGING THE PROBE COVER DISPENSER

A vertical window in the handle of the 9020 allows you to see when the probe cover dispenser is empty. To replace the dispenser:

1. Ensure that the probe is retracted, then remove the probe cover dispenser from the thermometer's handle by pulling on the tab at the end of the dispenser (Figure A). Discard the empty dispenser.

2. Check to see that the first probe cover in the new dispenser is positioned properly (Figure A).

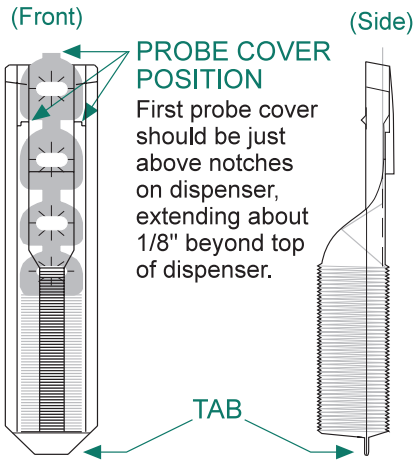

(Front)
(Side)
PROBE COVER POSITION
First probe cover should be just above notches on dispenser, extending about 1/8" beyond top of dispenser.
TAB

Figure A

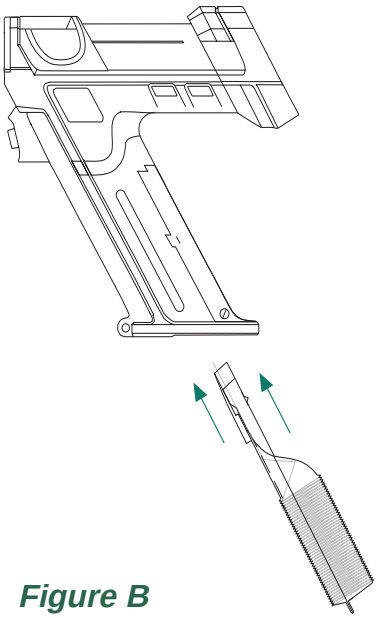


Figure B

3. Insert the new probe cover dispenser (flat end first) into the handle of the thermometer. Align the edges of the dispenser with the slots inside of the handle, then slide the dispenser upward until it snaps into place (Figure B). The 9020 is now ready for use.

   You should routinely take a moment to inspect the sensor lens for clarity, and clean as needed. Refer to "Cleaning the Probe Sensor Lens" on the next page.

CLEANING THE PROBE SENSOR LENS

Dust and other minute particles of environmental debris can build up on the probe sensor lens during normal use of the 9020.

The probe sensor lens should always be shiny and clear. Inspect the lens frequently and clean as necessary. The lens should also be cleaned as routine maintenance according to the two cleaning methods below.

NOTE: A dirty lens will affect the accuracy of temperature readings.

METHOD 1: REMOVING LIGHT DUST
(RECOMMENDED DAILY)

1. Advance the slide to extend the probe tip.
2. Leave the probe cover in place. Using a dry cotton swab, gently press the probe cover against the sensor lens (Figure C). Loose debris on the lens will adhere to the probe cover.

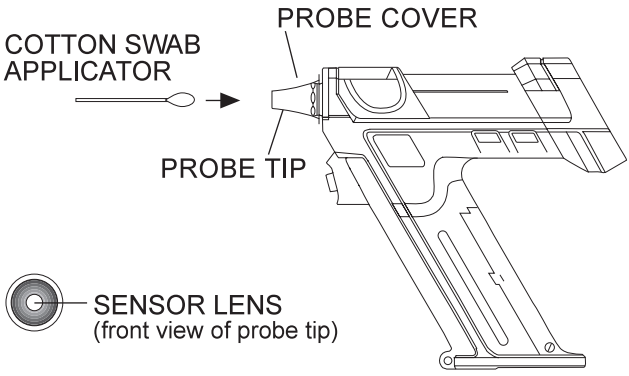


Figure C

3. Move the slide back to its original position to remove the probe cover and retract the probe tip. The 9020 is now ready for use.

METHOD 2: REMOVING SMUDGES OR EXCESSIVE DEBRIS
(RECOMMENDED AS NEEDED OR IF LOW TEMPERATURE READINGS PERSIST AFTER METHOD #1)

MATERIALS NEEDED

- Isopropyl Alcohol
- Cotton Swab

1. Advance the slide to extend the probe tip.
2. Manually remove the probe cover to expose the probe sensor lens.
3. Using a cotton swab slightly moistened with isopropyl alcohol, gently wipe the surface of the lens to remove debris (Figure D).
4. Wipe the lens with a dry cotton swab to absorb moisture and pick up any remaining debris (Figure D).
5. Move the slide back to its original position to retract the probe tip.
6. Allow 30 minutes before using the thermometer.

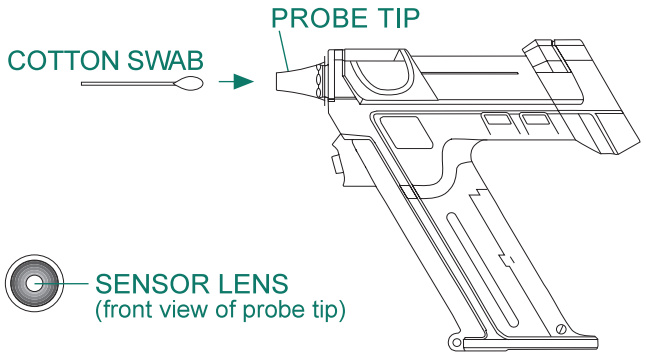


Figure D

CLEANING THE THERMOMETER

Clean the exterior of both the 9020 and the optional wall mount as needed. Wipe all surfaces with a clean cloth, dampened with warm water and a mild detergent or germicidal cleaner (see the table below for acceptable cleaning agents).

- As some solutions may stain, try a small test area first.
- Make sure that the cloth is damp, but ***not*** wet.
- Do not allow cleaning solution to run inside of the thermometer.
- Never immerse the thermometer in the cleaning solution.

CLEANING AGENT	LENS	THERMOMETER	WALL MOUNT
Ammonium		✔	✔
Bleach (50%)		✔	✔
Sproricidin®		✔	✔
MetriSpray™		✔	✔
Cidex		✔	✔
Detergent (mild)		✔	✔
Isopropyl Alcohol	✔	✔	✔
Lysol		✔	✔

Refer to the *WELCH ALLYN 9020 Infrared Tympanic Thermometer Technical Manual* for the procedure to sterilize the thermometer.

Sporicidin is a registered trademark of Sporicidin International (800) 424-3733. MetriSpray is a trademark of Metrex Research Corporation (800) 841-1428.

CHANGING THE PROBE TIP

A damaged probe tip can tear the ultra-thin film in the probe covers. A temperature taken with a torn probe cover may result in a measurement that is higher than the actual temperature.

Periodically inspect the plastic probe tip for nicks or other damage, and replace if necessary.

MATERIALS NEEDED • Probe Tip Replacement Kit (Part #20688-000)

1. Advance the slide to extend the probe tip.
2. Manually remove the probe cover to expose the probe tip.
3. Remove the probe tip by turning it counterclockwise (Figure E). Discard the damaged probe tip.
4. Install the new probe tip by turning it clockwise, then hand-tightening (5 inch-lbs.) until it is positioned snugly against the base of the probe. Do not over-tighten the tip.
5. As a precaution, clean the sensor lens to remove any dust or debris that may have adhered to the exposed lens during replacement of the probe tip.

   Follow the steps for “Cleaning the Probe Sensor Lens – Method 2” described earlier in this section of the manual.

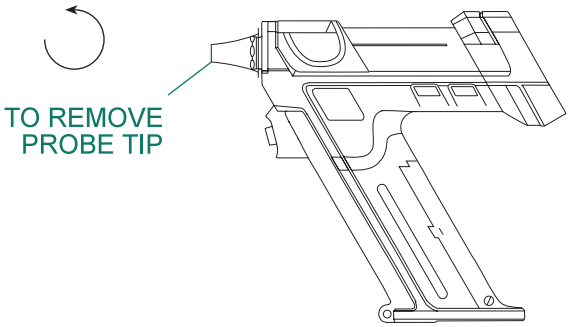


Figure E

REPLACING THE BATTERIES

Under normal use, a set of batteries will provide power to the 9020 for about 1 year, depending on usage. When battery power becomes low, a Battery symbol appears on the display and the thermometer cannot be used until they are replaced.

1. Remove the screw that secures the battery compartment door, then press the release notch to remove the door (see Figure F).
2. Remove the four depleted batteries and dispose of properly.
3. Press SCAN button to reset the thermometer.
4. Install four new AAA size Alkaline batteries in the ***exact*** order and position as shown in the diagram inside of the battery compartment.

   The 9020 will automatically perform a diagnostic self-test of the electronics (indicated by a segment cycling through the display). If not, reinstall the batteries to ensure correct positioning.

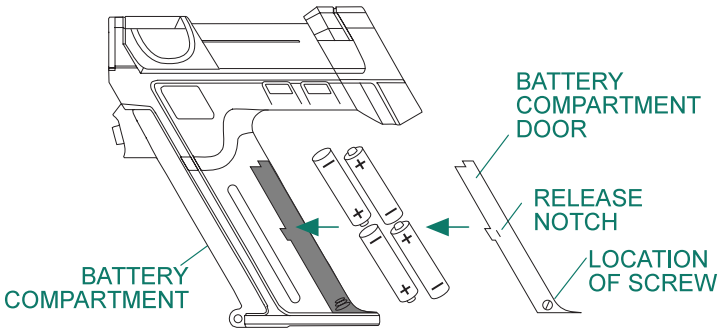


Figure F

5. Replace the battery compartment door, then reinstall the screw to secure the door (Figure F).

THEFT PROTECTION

The optional wall mount serves as a base for the thermometer when it is not in use. You can lock the 9020 into the wall mount by rotating the release key 90° to the right. Once in this position, the key can be removed by pulling downward.

An optional security cable (20796-000) may be added to your thermometer and wall mount for single area use.

OPTIONS & ACCESSORIES

WELCH ALLYN 050 Probe Covers
WELCH ALLYN Part #05051
Box of 2 dispensers (100 probe covers/dispenser)
Packaged in quantities of 5,000 probe covers/carton

Probe Tip Replacement Kit
WELCH ALLYN Part #20688-000
12 replacement probe tips

Security Cable
WELCH ALLYN Part #20796-000
Lanyard cable attaches 9020 to wall mount for added security

WELCH ALLYN 9020 Wall Mount
WELCH ALLYN Part #20757-400
Additional or replacement wall mount for the 9020

Portable Stand
WELCH ALLYN Part #08071-000
Rolling stand provides additional security without sacrificing mobility

WELCH ALLYN 9600 Calibration Tester
WELCH ALLYN Part #01800-210
Temperature reference for calibration of WELCH ALLYN thermometers (both infrared and thermistor types)

TROUBLESHOOTING

PROBLEM	SOLUTION
Slide Will Not Move	Probe cover dispenser missing or empty. Check position of dispenser in thermometer's handle. If empty, install new dispenser.
	Probe covers positioned improperly within probe cover dispenser. Remove dispenser from thermometer handle. Pull on first probe cover to remove any misaligned or bent covers. Re-position first probe cover to extend 1/8" beyond top of dispenser, then reinstall dispenser to thermometer handle. If problem persists, replace probe cover dispenser.
	Probe tip not installed securely and may be lodged against reference arm (shields lens when probe retracted). Looking into front of 9020, press down on reference arm while moving slide forward. Hand tighten tip (clockwise) until snug against base of probe, then retract probe.
High Temperatures	Check current operation mode of the 9020. Core and rectal modes obtain higher temperatures than oral mode (test mode is used for calibration only).
	Detected warmer temperature prior to inserting probe into ear, or heat source (such as a heat lamp) nearby when taking temperature. Insert probe into ear, wait 1 second, then press SCAN button.
	Check integrity of probe cover prior to taking temperature. Damaged (or missing) probe cover can result in temperature reading up to 1.5°F higher than actual temperature.

PROBLEM	SOLUTION
Low Temperatures	Improper technique. Insert probe snugly into ear, completely closing off ear canal.
	If ear canal is curved significantly, sensor's view of the tympanic membrane may be obstructed. Gently pull up and back on external ear to straighten ear canal before inserting probe.
	Debris on probe sensor lens. Clean lens. See "Maintenance" section of this manual for procedure.
	Probe tip not installed securely; hand tighten tip (clockwise) until snug against base of probe. See "Maintenance" section of this manual for procedure.
	Check current operation mode of the 9020. Oral mode obtains lower temperatures than core and rectal modes (test mode is used for calibration only).
Inconsistent Results of Repeated Temperatures	Not enough time elapsed since last temperature taken (same ear). Insertion of probe results in slight "draw down" of ear canal temperature. Wait 2 minutes to allow temperature to stabilize between repeated temperature measurements in the same ear, or use patient's opposite ear.
	Improper scanning technique. Insert probe snugly into ear, completely closing off ear canal.
	If ear canal is curved significantly, sensor's view of the tympanic membrane may be obstructed. Gently pull up and back on external ear to straighten ear canal before inserting probe.

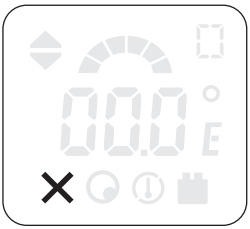
PROBLEM	SOLUTION
Improper Delivery of Probe Cover or Probe Cover Positioned Incorrectly on Probe	Probe covers positioned improperly within probe cover dispenser. Remove dispenser from thermometer handle. Pull on first probe cover to remove any misaligned or bent covers. Re-position first probe cover to extend 1/8" beyond top of dispenser, then reinstall dispenser to thermometer handle. If problem persists, replace probe cover dispenser.
	Obstruction between probe and probe cover dispenser. Remove dispenser, inspect thermometer handle and remove debris, if any. Ensure probe covers are properly positioned in probe cover dispenser, then reinsert dispenser into handle.
	Probe tip is damaged. Replace with new probe tip. See "Maintenance" section of this manual for procedure.
	Damaged probe covers. Replace probe cover dispenser.
Probe Cover Breakage	Probe tip is damaged. Replace with new probe tip. See "Maintenance" section of this manual for procedure.
	Probe covers positioned improperly within probe cover dispenser. Remove dispenser from thermometer handle. Pull on first probe cover to remove any misaligned or bent covers. Re-position first probe cover to extend 1/8" beyond top of dispenser, then reinstall dispenser to thermometer handle. If problem persists, replace probe cover dispenser.

PROBLEM	SOLUTION
Continuous, Intermittent Audible Tone	Probe is partially extended. Ensure slide is fully retracted.
	Improper operating condition. Check display for error status. See “Error Codes” section of this manual for explanation.
Blank LCD Display, No Temperature on Display	Probe extended for over 5 minutes. Retract probe.
	Battery power depleted. Replace batteries. See “Maintenance” section of this manual for procedure.
Unable to Remove 9020 from Wall Mount	Wall mount’s spring latch mechanism is engaged. Hold release key (underside of wall mount) to the right while removing thermometer.
	Release key for spring latch mechanism (underside of wall mount) is missing or locked. Insert key into mechanism, then rotate key clockwise until tab is perpendicular to front panel of wall mount. Hold release key to the right while removing thermometer.

ERROR CODES

When the 9020 detects an improper operating condition, the malfunction symbol (X) will appear with one of the numeric error codes (Er) below.

Set the thermometer aside for one hour to allow the electronics to stabilize to room temperature.



- If the 9020 is faulty, the error status will remain to indicate that the thermometer needs service.
- If the condition is transient in nature, the error status will disappear. The 9020 will then self-calibrate, and be ready for use.

ERROR	EXPLANATION
Er2	The ambient temperature is beyond the operating range of 60°F – 104°F. Allow the thermometer to stabilize at normal room temperature before use.
Er4	The infrared sensing system may be detecting a nearby temperature source that is greater than 110°F. If not, the thermometer requires service.
Er5 Er6	The ambient temperature is above 110°F. If not, the thermometer requires service.
Er0 Er1 Er3 Er7 Er8 Er9	Internal error. The thermometer requires service.

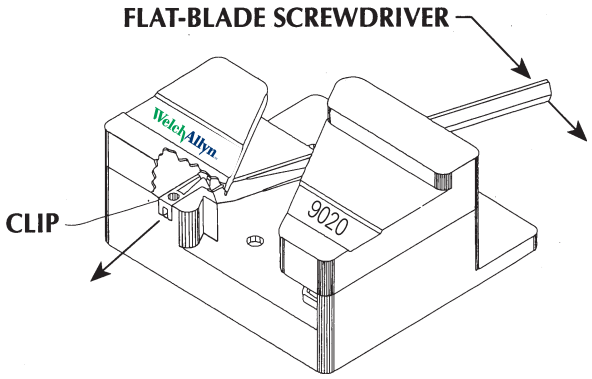
SECURITY CABLE INSTALLATION (OPTION)

For added security, an optional Security Cable may be installed that will connect the thermometer to the wall mount.

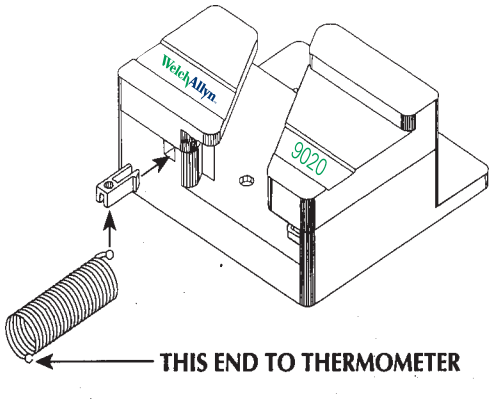
MATERIALS NEEDED

- Security Cable (Part #20796-000)
- Flat-Blade and Phillips Screwdrivers

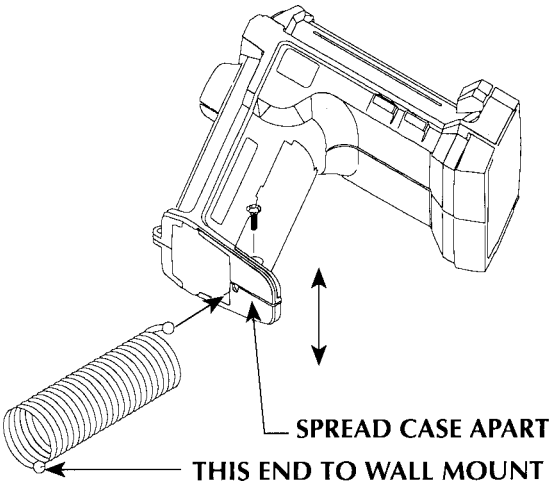
1. Insert screwdriver into the wall mount to release the clip.



2. Insert one end of the security cable through the slot of the clip, then reinsert the clip into the wall mount.



3. Remove the screw from the battery door. Spread the case of the thermometer just wide enough to insert the other end of the security cable. Close the battery door and reinstall the screw.



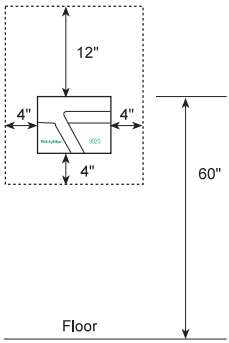
WALL MOUNT INSTALLATION

The following guidelines are provided to ensure proper placement and installation of your thermometer wall mount.

The top of the wall mount should be located about 60 inches from the floor. You will need at least a 4 inch clearance from the bottom and sides of the wall mount and 12 inches from the top.

Wall Mount Requires Three Pan or Round Head Screws (Your Choice of #6, #8, or #10)	
Wall Surface	Fastener
Dry wall	E-Z Twist in anchor (Molly or toggle)*
Concrete/masonry	Expanding anchors
Wood	Wood screws

*Available from Welch Allyn in quantities of 100, part number 20938-000



SPECIFICATIONS

Thermometer Type: ..... Infrared

Measurement Range: ..... 23.9°C to 42.2°C (75°F to 108°F)

Measurement Calibration Accuracy: ..... ± 0.1°C at 37°C - 39°C
±0.2°F at 98°F - 102°F
Other ranges meet ASTM Specification #E 1112 Table 1

Operating Environment: ..... 15.6°C to 40.0°C (60°F to 104°F)
70% relative humidity

Storage Environment: ..... -55°C to 65°C (-67°F to 149°F)
70% relative humidity

Case Dimensions: ..... 15.38cm x 15.38cm x 5.12cm
(6in x 6in x 2in)

Weight (including batteries and probe covers): ..... 258 gr (9.1 oz)

Case Material: ..... ABS Plastic

Power Source: ..... AAA batteries (4)

Battery Life: ..... Approximately 1 Year

Display Type: ..... Liquid Crystal Display

LIMITED WARRANTY

WELCH ALLYN LIMITED WARRANTY: NEW UNITS–1 YEAR
REFURBISHED UNITS–1 YEAR

Welch Allyn, Inc. ("Welch Allyn") warrants that each new Welch Allyn Model 9020 Thermometer (the "Product") is free from defects in material and workmanship under normal use and service for a period of one year for new units or 1 year for refurbished from the date of shipment from Welch Allyn. This Warranty shall be fulfilled by the repair or replacement by Welch Allyn or its authorized representative, at Welch Allyn's discretion of any such defect, free of charge for parts and labor.

EXCLUSIONS FROM WARRANTY

This Welch Allyn Warranty shall be void, and Welch Allyn will not be responsible for any loss associated with, any of the following: (i) probe tips damaged or defective after delivery to Customer, (ii) not providing routine maintenance and calibration, (iii) missing, damaged, or discharged batteries after the first year, (iv) any product that (a) has had the serial number defaced, (b) has been repaired by anyone other than Welch Allyn or an authorized Welch Allyn service representative (c) has been altered or (d) has been used in any manner other than in accordance with instructions or shows evidence of abusive handling.

WARRANTY CLAIMS

If a Product requires service during the applicable warranty period, the Customer should immediately return the Product at Customer's own expense to Welch Allyn, 7420 Carroll Road, San Diego, CA 92121. Any risk of loss or damage in shipment of the Product to Welch Allyn shall be borne exclusively by Customer. Repair or replacement will be made at Welch Allyn's expense subject to the terms of this Warranty. Product repaired under warranty provisions will be returned to Customer at Welch Allyn's expense. Any damage in shipment from Welch Allyn is the responsibility of the delivery carrier.

LIMITATIONS

In no event shall Welch Allyn be liable for any incidental, indirect, or consequential damages in connection with the purchase or use of any Product.

This Warranty is in lieu of other obligations or liabilities on Welch Allyn's part, and Welch Allyn neither assumes, nor authorizes, any representative or other person to assume for it any other liability in connection with the sale of the Product.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, OR OTHER WARRANTY OF QUALITY, WHETHER EXPRESS OR IMPLIED, WELCH ALLYN WILL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Welch Allyn™

70858-0000B